

WHAT IS CLAIMED IS:

1. An optical printing apparatus in which an image data indicative of a density of each of a plurality of pixels forming an image with a first gradation value is input, so that a plurality of exposure elements of a print head are each driven to perform an exposure with a required quantity of exposure light (i.e., product of a quantity of light and an exposure time), thereby forming a pixel corresponding to each of said exposure elements on a photosensitive printing medium which generates a color of a density corresponding to said required quantity of exposure light, said apparatus comprising:

an exposure level conversion section for converting said image data into corresponding exposure level data indicative of a density of each pixel with a second gradation value greater than said first gradation value indicated by said image data, and for outputting the exposure level data thus converted; and

a head driving section being connected to receive said exposure level data from said exposure level conversion section and driving, based on said exposure level data, each element of said print head to expose said photosensitive printing medium in such a manner that a quantity of light corresponding to said exposure level data is exposed to said photosensitive printing medium, thereby forming a pixel of a density corresponding to said exposure level data on said photosensitive printing medium.

2. The optical printing apparatus as claimed in claim 1, wherein said photosensitive printing medium has a nonlinear chromophore density characteristic in which the density of a color generated in accordance with a quantity of exposure light is nonlinear with respect to the quantity of exposure light, and

said exposure level conversion section converts said image data into

said exposure level data in such a manner that the density of a pixel formed on said photosensitive printing medium corresponding to said exposure level data is linear with respect to the image data corresponding to said exposure level data.

3. The optical printing apparatus as claimed in claim 1, wherein upon exposure of each element of said print head, the quantity of light per unit time of each element is constant, and said head driving section drives each element of said print head in such a manner that the exposure time of each element is proportional to the magnitude of said exposure level data.

4. The optical printing apparatus as claimed in claim 1, wherein said exposure level conversion section includes an exposure level conversion table for correlating said image data and said exposure level data with respect to each other.

5. The optical printing apparatus as claimed in claim 1, wherein said image data indicates the density of each of three primary colors for a plurality of pixels forming a color image with said first gradation value for each pixel, and

said exposure level conversion section converts said image data input thereto into corresponding exposure level data for each color which is indicative of the density of each color of each pixel represented by said image data with a second gradation value greater than said first gradation value for each color, and

said head driving section receives said exposure level data for each color and drives each element of said print head to expose said photosensitive printing medium in such a manner that a quantity of light corresponding to said exposure level data is exposed to said photosensitive printing medium, thereby forming a pixel of a density for each color corresponding to said exposure level data for each color on said photosensitive printing medium.

6. The optical printing apparatus as claimed in claim 1, further comprising:

an exposure level correction section for correcting exposure level data output from said exposure level conversion section by a correction factor for each element of said print head, and outputting a corrected exposure level,

wherein said head driving section receives said corrected exposure level and drives each element of said print head to expose said photosensitive printing medium in such a manner that a quantity of light corresponding to said input corrected exposure level is exposed to said photosensitive printing medium, thereby forming a pixel of a density corresponding to said corrected exposure level data on said photosensitive printing medium.

7. The optical printing apparatus as claimed in claim 6, wherein said exposure level correction section comprises:

a correction factor storing section for storing a correction factor for each element of said print head; and

a table describing corrected exposure level data while correlating each correction factor and exposure level data with respect to each other;

wherein said exposure level correction section determines corrected exposure level data from a correction factor read out from said correction factor storing section and an input exposure level data while referring to said table, and outputs said corrected exposure level data thus determined.

8. The optical printing apparatus as claimed in claim 6, wherein said exposure level correction section comprises:

a correction factor storing section for storing a correction factor for each element of said print head; and

a multiplier for multiplying said correction factors and exposure level data;

wherein said exposure level correction section determines corrected exposure level data from a correction factor read out from said correction factor storing section and an input exposure level data, and outputs the corrected exposure level data thus determined.

9. The optical printing apparatus as claimed in claim 1, further comprising:

an accumulated exposure time information storing section for storing accumulated exposure time information corresponding to an accumulated exposure time of said print head; and

an exposure level correcting section for correcting exposure level data output from said exposure level conversion section in accordance with accumulated exposure time information output from said accumulated exposure time information storing section, and for outputting the thus corrected exposure level data;

wherein said head driving section receives said corrected exposure level and drives each element of said print head to expose said photosensitive printing medium in such a manner that a quantity of light corresponding to said input corrected exposure level is exposed to said photosensitive printing medium, thereby forming a pixel of a density corresponding to said corrected exposure level data on said photosensitive printing medium.